

## AGC/WSDOT Structures Team Minutes

May 20, 2005

Members in Attendance

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Others in attendance

Dr. John Stanton, from the University of Washington

Dr. Marc Eberhard, from the University of Washington

### **Review and Approval of the April 22, 2005 Meeting Notes**

There was an informal discussion about the super girder costs on the Key's Road Bridge job in Yakima. The superstructure cost was high because of the trucking costs, permit costs for the overload hauling, and because of the accelerated schedule to meet the fish window for work over the river.

Jugesh said the State would most likely provide two options on large bridges that had super girder superstructures, one would be the super girders and the other option would be a steel superstructure.

Mo sought feedback on cement shortages in eastern Washington, that the concrete suppliers weren't taking new customers and that they were limiting daily concrete placement per customer to 150 max. Per day. The unit price for concrete per yard was

also going up. Some eastern Washington contractors said they had purchase orders for the concrete on projects and hadn't heard it was a problem.

### **New Vibration Limits Specification**

Jim Schettler handed out his final draft of the new concrete protection against vibration specification. There were some minor modifications of the specification, see the attached word document for the final draft.

**Action Item:** Add to the future Special Provisions update.

### **Pile Driving Tolerances- Std. Spec. 6-05.3(11)A**

The following specification was discussed and the consensus reached was that the following changes would be made:

#### **6-05.3(11) A Tolerances**

For elevated pier caps, the vertical centerline of each pile at cut-off elevation shall be within 2 inches in any direction of the locations indicated in the Contract. Piles shall be installed such that the axial alignment of the top 10 feet of the pile is within ½ inch in one foot of the specified alignment.

For piles installed below footings, the vertical centerline of each pile at cut-off elevation shall be within 6 inches of the horizontal locations indicated in the Contract, unless specified otherwise. No pile edge shall be nearer than 4 inches from the edge of any concrete footing. Piles shall be installed such that the axial alignment of the top 10 feet of the pile is within ½ inch in one foot of the specified alignment (see Fig.1).

For all piling described above, no misaligned steel or concrete piles shall be pulled laterally. A properly aligned section shall not be spiced onto a misaligned section for any type of pile. Unless the Contract shows otherwise, all piles shall be driven vertically.

**Action Item:** Add the revised specification to the amendments to the Std. Specifications package.

### **Special Provisions “Removing Portions of Exist. Br.”**

Mo handed out a revised version of the general special provision entitled “Removing Portions of Existing Concrete”. There were some minor revisions to the wording but by enlarge the new specification wasn't revised further.

**Action Item:** Revise and implement this GSP.

### **Bridge Deck Curing**

There was further discussion of bridge deck curing to try and eliminate cracking of the decks, the discussion focused on if curing compound could be applied immediately after tining, and not worry about bleed water, and to remove this statement from the specifications. No one seemed to have a problem with this.

There was a discussion about doing away with curing compound and just use a wet curing method or a fogging of the deck concrete to aid in the curing.

Another discussion was possibly eliminating the curing compound and immediately cover the deck with wet burlap and then visqueen to keep the deck wet, to not wait for the initial concrete set, similar to the way latex concrete is cured.

Another idea was to check for the wetness of the burlap under the visqueen every 6 to 8 hours and add moisture if necessary to promote the curing.

Mo also advised that the cement suppliers were doing shrinkage tests on our deck concrete to see if this could be a problem. The initial 28-day test didn't show a shrinkage problem with the 4000D mix.

Several other ideas discussed were other curing compounds than what we are currently using, curing blankets with hoses so water could readily be introduced, and possibly a shrinkage specification for concrete mixes used in deck concrete.

**Action Item:** Mo will make revisions to this Spec and will discuss further at the next meeting.

### **Results of Parametric Cost Study**

Kevin Parrish and Chris Deane did a cost study of whether cast in place retaining walls are cheaper if the faces of the wall are parallel instead of having one of the wall faces battered as they are now shown in the std. Plans. Both Kevin's and Chris's analysis showed that the walls were cheaper with the battered faces, the concrete and steel costs more than offset the cost of easier forming. The only walls that are cheaper with parallel faces are walls less than 10 feet tall.

**Action Item:** Bridge is going to design their new standard plan retaining wall plans using LRFD code with a battered face as currently exists.

### **Deck Finishing Methods**

There was a brief discussion about deck finishing with roller screeds and Texas screeds for decks less than 20 feet wide. Mo didn't think that these methods gave the State a finish that we wanted and that we may want to reduce the current minimum width to use with a deck finishing machine for 20 minimum width to something less than 20 feet.

**Action Item:** Mo will modify the Specs and discuss at our next meeting.

**Rapid Construction of Bridges Presented by the U of W.**

Dr. Stanton & Dr. Eberhard of The University of Washington have been given a research project by the WSDOT to look for rapid construction methods for bridge structures. The presentation centered around using some precast concrete members and how to connect these precast members together so as to resist seismic loadings. They looked at how to connect shafts to precast columns, and footings to precast columns, and precast columns to precast cross beams.

Dr. Stanton handed out details of four different alternates of precast column cap connections and sought input from the team. Feedback highlights from the team:

- Using jacks to hold up the cap is a concern. Make the column diameter larger to support the crossbeam. Use temporary wedges to adjust for crossbeam slope.
- The 30" proposed crossbeam depth was a concern for supporting the long span girders and deck weight.
- Suggestions were made to make provisions for application of this technology for the widenings as well as new construction.
- High strength bar tensioning is a concern due to restricted room for jacking.
- There may not be a need for tensioning the bars if the design relies on the concrete set up and strength. If the bars are tensioned, leave the nuts permanently in place.
- Use the crossbeam as a template.

The meeting was adjourned at 12:00 PM.

Next meeting is scheduled on June 17<sup>th</sup> at the same location.